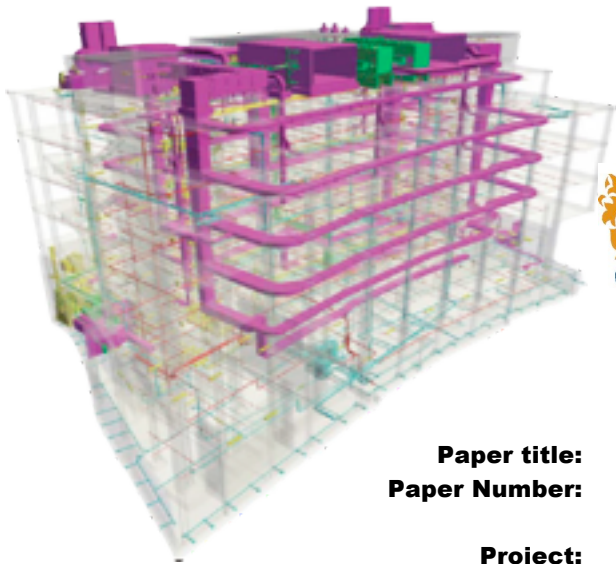




Massey University
COLLEGE OF CREATIVE ARTS

Paper title: Spatial Design Systems and Technology
Paper Number: 224.371

Project: 1_Part B_Working Drawings & NZS3604

Hand-in Date: 28th September 5pm as a PDF via Stream {more info to come}, bound A3 print out, laser cut model & 1:20 sectional model (MUST BE HANDED IN ON TIME REFER PAPER OUTLINE) you will lose marks if handed in late

Introduction: This project asks you to produce a set of preliminary working drawings of your studio project [Instruments of Site : (in)Sight], a laser cut sketch model from those digital drawings, and a 1:20 sectional model showing timber framed construction according to NZS3064.

Printed drawings currently serve as the primary means of communication for constructing buildings, interior spaces, joinery, furniture, etc. Working drawings are scaled, detailed, and accurate representations of a space or object and its construction specifics. Construction drawings need to follow established architectural graphic conventions to allow easy and correct understanding of proposed design intentions. You will construct the working drawing set on Vectorworks.

CAD and BIM (building Information Modeling) techniques are contributing to a major change in the way spatial design is designed, communicated and constructed. The mode of BIM drawing mimics construction of a 3D object, rather than former 2D representational techniques. Advanced printing and cutting technology is now allowing for larger items to be formed directly from the CAD medium, with research continuing into 1:1 printing directly to site. Through digitally modeling your building for your working drawings you will also be able to produce a laser cut sketch model.

NZS3604 is the New Zealand Standard for Timber Framed Buildings. You will demonstrate an understanding of this Standard through both your working drawing set, and a 1:20 sectional model. This model needs to accurately represent the construction of a section of your building, including correctly sized and space timber framing.

Aim: Introduce the fundamentals of setting up a CAD and BIM standard and producing a set of working drawings and translation of BIM files to a physical model.

Brief: This assignment is structured into 2 parts.

You will start by setting up Vectorworks, using classes and layers. Then draw a 3D model of your proposed building, which then will be used to create the plans and sections, etc. Working drawings are often used as part of the design process, they are a great way to check design ideas work/fit within the requirements of the project.

The Set should contain, but is not limited to:

Cover Sheet
Site Plan
Floor Plan
Elevations
Sections
Details

Part one [drawing]: Once your 3D CAD model of your building is underway, set out each sheet with a basic layout of content. Before the mid-semester break, put together a 50% check set to be handed in for comments and red-lining.....

Part one [model]: Once your CAD model is built, work with a copy of your digital model to prepare a file for a laser cut model. Cut and assemble model as required. Given that the model is small scale, consider what material to edit, what to maintain. Consider the function of the model – the communication of primary spatial idea/s and language. You are to decide what material(s) to use. If you manage your time wisely you should be able to use this model to inform your Studio project.

Part two [drawing]: After the break, continue drawing and integrate redline information once your check set is returned. Do a final check of document prior to issuing the set as a printed document, and digital copy.

Part two [model]: Building your CAD model should have given you a good understanding of the building's construction. Demonstrate this in a 1:20 scale model of a 2m deep section of your building. This model should be built using appropriate materials and should show accurate timber frame construction.

Project Requirements: A set of Preliminary working drawings of your studio project.
A small laser cut model to scale.
A 1:20 sectional model showing construction to NZS3604.

As well as a printed, bound copy of your drawings, and your two models, you will provide digital copies of your drawings and laser cut file in the following format:

Drawings: **371_p2_lastname_firstname_dwg_07.pdf**
model file: **371_p2_lastname_firstname_laser-07.ai**

224.371_Project One_Part A_cont.

Assessment: The project will be assessed to the extent that it:

- Investigates architectural graphic communication
- Creatively explores digital media and its relationship to traditional architectural graphic processes
- Demonstrates understanding of timber framed structure
- Effectively and coherently communicates design intent and structural understanding through both drawings and models

Feedback will be given after completion of the project.

Learning Outcomes: The student should be able to:

- Confidently use computer applications introduced in this project
- Apply computer application skills gained to inform design process and design presentation
- Understand the requirements of working drawings
- Understand and reference NZ Building Standards

Procedure and Timetable:

week 4

Mon. 6th Aug 10B01

Project intro

Wed. 8th Aug 10B01

NZS3604 intro and quiz

Independent study: **set up VW & start drawing model**

week 5

Mon. 13th Aug 10B01

Drawings: what needs to be on them, how they work

-set up VW drawing sheets

-design and draw up A3 title block

go to help>vectorworks help>search tab

search "Creating a Custom Title Block"

follow directions

Independent study: **create laser cutting files & model**

Wed. 15th Aug Office hrs / Studio 4 review

week 6

Mon. 20th Aug 10B01

Check drawing progress with tutor

Wed. 22nd Aug Office hrs / Independent study

By 5pm Friday 24th Aug

Print out 50% check set, give to tutor for red-lining

Study break

week 7

Mon. 10th Sep 10B01

1:20 sectional model

Wed. 12th Sep Office hrs / Independent study

week 8

Mon. 17th Sep 10B01

Amend drawings from red-lining

Wed. 19th Sep Office hrs / Independent study

week 9

Mon. 24th Sep 10B01

Final check, finishing touches to drawings & sectional model

Wed. 26th Sep Office hrs / Independent study

Final hand in 5pm Friday 28th September

References:

Recommended Reading:

- Allen, E. (1999). *Fundamentals of building construction: Materials and methods* (3rd ed.). New York: Wiley.
- Ashcroft, R. (1992). *Construction for interior designers* (2nd ed.). London: Longman Scientific and Technical.
- Bryan, T. (2005). *Construction technology: Analysis and choice* (1st ed.). Malden, MA: Blackwell Pub.
- Burden, E. E. (2005). *Illustrated dictionary of building design + construction*. New York: McGraw-Hill.
- Condor, T., & Building Research Association of New Zealand. (2000). BRANZ House Building Guide (Rev. ed., p. 250). Porirua City, N.Z.: BRANZ.
- Ching, F. (2000). *Building construction illustrated* (3rd ed.). New York: John Wiley.
- Duncan, J. R. (2002). *Innovation in the building sector: Trends and new technologies*. Porirua N.Z.: BRANZ.
- Glossary of building terms*. (1998). Wellington N.Z.: Standards New Zealand.
- Kilmer, W. O. (2003). *Construction drawings and details for interiors: Basic skills*. New York: John Wiley & Sons.
- McGowan, M. (2003). *Interior graphic standards*. New York; Chichester: Wiley.
- Seeley, I. H. (1995). *Building technology* (5th ed.). Basingstoke: Macmillan.
- Stitt, F. A. (1998). *Working drawing manual*. New York; London: McGraw-Hill.
- Styles, K. (2004). *Working drawings handbook* (4th ed.). Boston, MA: Elsevier/Architectural Press.
- Wakita, O. A. (2002). *The professional practice of architectural working drawings* (3rd ed.). New York: J. Wiley & Sons.

Websites:

- Vectorworks: <http://www.nemetschek.net/>
- Digital Vision: http://v3.digitalvis.com/working_drawings_gallery.php